

# Children's Play Area Sunshade Canopy

## Cross reference to related Applications

This application is a Continuation-in Part of co-pending application Sno. 09/960,483 filed on 09/24/2001.

Statement regarding Fed sponsored R & D (none)

## Background of the Invention

The invention at hand relates generally to a demountable sunshade canopy structure and in particular sunshade canopies for ultraviolet (UV) sun ray protection of children's play area.

It is increasingly acknowledged that physically challenging outdoor play structures are a benefit to the physical and emotional development of young children. A code of safety specifications for the construction and maintenance of children's play structures has been developed by National Play and Playground Authorities, published (1996) by the National Recreation and Park Association of Arlington, Virginia. These construction specifications describe construction features for support of children slides, swings, climbing apparatus, etc. which minimize risk of injury to children engaged in all manner of predictable use and misuse of the play structures.

The specification require that the play structures be mounted on a platform or on towers elevated up to six feet above a resilient (non-hardened) surface such as cork or rubber panels. and the towers or platform be supported by a very limited number of support columns. The columns are to capped at the top without exterior fittings on which a child may be injured while climbing upon or falling from the platform or tower. The support columns are capped at the top to discourage a child from climbing or holding on while suspended from the column top.

The vertical support columns have been in the past a source of injuries to children engaged in unintended use of these structures. Accordingly, the minimum number of vertical columns, all free of hand- or foot holds, has become a specification for acceptable safe design.

separate from the safe construction design referred to above which have and are significantly reducing playground injuries there is a growing threat to children's health when they are engaged in outdoor play and exercise in the sun shine.

The earth's protective atmosphere ozone layer has been significantly depleted due to release of chemical pollutants into the atmosphere during the last five decades. The result of the ozone depletion is that the solar ultraviolet (UV) rays are significantly more intense and comprise a serious health risk to children without protection when playing in the now unfiltered UV sun radiation..

In 1930 the risk of developing melanoma from sun exposure was 1 in 1500 people. Today, a person's risk of developing skin cancer at some time during their life is 1 in 75. Skin cancer is the most common cancer in the United States each year with than one million new cases diagnosed each year. Currently this year, 47,700 Americans will be diagnosed with life threatening melanoma and 7,700 will die of this disease. The current prognosis for this disease is that approximately 1 out of 5 children in the United States will experience some form of skin cancer during their lifetime. Furthermore, exposure to the current intensity of solar UV radiation reduces the effectiveness of the immune system. This effect is of special importance in children's health.

Sources of the above statistics are to be found in publications of the American Academy of Dermatology, American Cancer Society, National Institutes of Health, U.S. Center for Disease Control and Protection and the Australian Cancer Society.

#### Objects of the Investigation

It is a first object of the invention to provide a sturdy, wind resistant demountable canopy structure suitable for shading a children's play area from direct rays of the sun

Another object of the invention is to provide a sturdy, wind resistance, demountable sun shade canopy for mounting on vertical support columns as used in children's standard safe outdoor play structures. The sunshade shade canopy structure as described herein, is in full compliance with recommended safety specifications for children's play areas.

Still another object this invention is to provide a sturdy, wind resistant, demountable sun shade canopy design adaptable to retrofit existing small area and extended children's play areas installations with effective sun shade protection.

Still another object is to extend the shade area beyond the basic play area perimeter so that the canopy covers slanted sun rays prior to reaching any activity of the play area perimeter under the shade cover. This kind of coverage of the canopy protects any kind of sun rays encountered in early morning activities or late afternoon play activities because the canopy extends over the basic perimeter of the play area.

These and other objects and advantages and diverse uses of this invention will be apparent from consideration of the following illustration, specifications and claims.

#### **Brief Summary of the Invention**

A demountable, wind resistant sun shade canopy suitable for mounting on a limited number of vertical columns, erected for the purpose of, or suitable for mounting on, extensions of a limited number of standard safe play area support columns. The canopy support structure, comprised of a plurality of uniquely shaped brackets which, when each is fixedly mounted provides at each column a mount for a cantilever beam extending outwardly toward the perimeter of the area to be shaded,

and simultaneously provides for the mounting of a hip beam extending toward the inner portion of the area to be shaded. Thus an extended-area to be shaded is a rigid support structure which is provided over a designated area which may be dependably shaded from the sun rays when a high density knitted polyethylene porous canopy cover is placed over the unique bracket supported plurality of cantilever and hip beam support members and secured about the perimeter of the canopy cover with an adjustable tension means.

#### **Brief Description of the Drawings**

Fig. 1 is a perspective view of a portion of an existing safe play structure without sun without sun protection, the play structure is shown mounted above a resilient ground cover;

Fig. 2 is a cross-section of the upper portion of support taken along the plane 2 - 2;

Fig. 3 is a plane view of a specified safe design single tower children's play area on which the innovative sun shade canopy has been erected, the play exercise devices are shown in phantom lines. From this illustration it can be seen that the perimeter of the shaded area extends beyond the basic area of the play area perimeter.

Fig. 4 is a sectional elevational view of the embodiment of this invention shown in Fig. 3 with portions of the play structure and canopy support members shown in phantom.

Fig. 5 is a perspective view of a construction bracket for mounting cantilever beam and hip beam members to form a support structure for mounting the canopy cover.

Fig. 6 is a cross-section of the construction bracket shown in Fig. 5, taken on the plane 6 - 6

Fig. 7 is a plane view of the connector for a four hip beam canopy support construction shown in the embodiment of the sun shade canopy illustrated in Figs. 3 and 4.

Fig. 8 is a perspective view of the of the hip beam connector illustrated in in Fig 7.

Fig. 9 shows a detail of means for fastening the canopy cover to the support structure with adjustable tension means.

Fig. 10 shows an elevation of an extended end of the cantilever member showing means for securing the canopy cover.

Fig. 11 is an elevation view of a second embodiment of the sun shade canopy structure mounted to cover a two tower specified safe children's play area.

Fig. 12 is a plane view of the embodiment of the sun shade canopy shown in the embodiment illustrated in Fig. 11. The children's play area devices are shown in phantom.

#### **Detailed Description of the Invention**

Fig. 1 illustrates a safe design of a children's play structure wherein a plurality of fixedly mounted vertical columns 12a, 12b, 12c, and 12d are shown. The columns 12a, 12b, etc. are mounted in foundations (not shown) beneath a resilient ground cover 14. The ground cover may be made of rubber or cork or matted materials to soften impact and reduce injuries to a child fallen thereon. The columns support a platform 16 from which a slide 18, a closed chute 20 and other children's climbing devices may be positioned.

The upper ends of conventionally designed vertical columns 12a, 12b, 12c and 12d are shown in Fig. 2 in a cross-sectional plane 2 - 2. A column cap 22 fits over the top of the column 12d.

The cap 22 is shaped with a reduced diameter lower section 24 which , when inserted into the hollow opening 26 of the vertical column comprises a secure mount for the column cap. Although such conventionally designed columns are fully compatible with invention, in order to avoid the possibility of rainwater leaking into the seam between lower portion 24 and column 12d, it is preferable to have the columns designed as depicted in Fig. 6 where the upper end of column 12a and 12b etc. has a smaller diameter than bracket 52 so that rainwater will flow over the juncture between the two without entering the seam.

Figures 1 and 2 are illustrative of safe children's play structures in compliance with the safety specifications developed by the National Play and Playground Authorities.. At his date there are tens of thousands of such play structures erected and being erected in the United States without any provisions for effective sun shades for children using such structures.

A plan view of a first embodiment of this invention is shown in Fig. 3 wherein a canopy cover 30 is shown as being supported over structural members described below which in turn are mounted above a children's exercise and play devices are shown in phantom lines below the canopy 30.

Fig. 4 is a cross-sectional elevation of the embodiment shown in Fig. 3 on plane 4 - 4. Vertical column 34 and 36 are fixedly mounted, respectively, in concrete foundation footings 40 and 42. The vertical columns support a platform or deck 44 at the ends of the platform at 44a and 44b fastened to the columns 34 and 36. The columns 34 and 36 terminate at approximately four feet above the platform or deck 44. Caps 22 such as shown in Fig. 2 have been removed from the upper column portion 60 and 62 of the columns 34 and 36 exposing the tops 48 and 50, respectively, of columns 34 and 36, respectively. Structural bracket fittings 55 and 57 have lower ends 56 and 58 which fit over the top 48 and 50 of columns 48 and 50 of columns 34 and 36. A illustrates a drop line from the outer perimeter of the

canopy to the ground, while the lines B illustrate the distance between the outer or second perimeter of the canopy and the first perimeter of the play area.

Figs. 5 and 6 are illustrative of the structural brackets fittings 55 and 57, more specifically, Fig. 5 depicts bracket 55 in a perspective cut-away and fragmentary view, while Fig. 6 is a view of the structural bracket 55 shown as cross-section on plane 6 - 6 . In preferred embodiments, the lower portion 56 of structural bracket 55 fits over the reduced diameter upper end 52 of the upper column portion 60. In rainy weather, water will flow over the juncture of lower portion 56 and upper end 52 and will not enter the seam where it might cause damage.

The upper end of the bracket is terminated with a transverse angularly mounted cylindrical rod 64. The rod 64 is mounted at an acute angle with the vertical cylinder extension. The angle with the horizontal is normally 22 degrees but is subject to adjustments for specific applications.

Figs. 5 and 6 show the mounting of the cylindrical rod 64 on a plate which in turn is mounted at an angle from the horizontal to bracket 55. The cylindrical rod 64 has an upper or first end 68, and a lower, or second end 70. Hip beam 72 comprises a straight section of a hollow metal steel pipe or rod. The hip beam 72 is positioned over the upper, or first end 68, of the angle mounted cylindrical rod 64 and secured with threaded bolts 76 passed through the hip beam 72 and the cylindrical 64.

The lower or second end 70 of the solid metal rod 64 is mounted over a cantilever beam 80 comprised of a straight section of hollow steel pipe at its upper end and secured with threaded means 81. The lower end of the cantilever beam is terminated with an oblong eyelet connector 84. As shown in Figs. 7 and 8, the four hip beams 72, 74 and the counter parts 72a, 74a terminate in juxtaposition and are secured together with a right angle joint 86.

Referring now back to Fig. 3, a porous knitted polyethylene canopy cover 30 is placed over the structure comprised of the hip beam members 72, 72a, 74, 74a, and

cantilever beam members 80, 80a, 82, and 82a. The canopy details are more clearly shown in Fig. 9. The canopy cover 30 is secured about its perimeter with a tension cable 90 which in turn is secured within a cable channel 92 sewn about the canopy perimeter 94. The tension on the cable is adjusted and maintained with a turn buckle 96. The canopy cover 39 is provided at its four corners with a reinforced opening 98 through which the oblong connector 84 located on the extreme end of the cantilevered beam 80 and its counterpart cantilever beams 80 and its counterpart 82, etc. protrudes.

A second embodiment of this invention is illustrated in Figs 11 and 12 wherein a two-tower safe design children's play area is shown. The play and exercise devices are shown in phantom lines. A porous shade canopy 104 is fabricated from knitted polyethylene strips and is constructed similarly to the single tower canopy 30. The two tower canopy cover 104 is sewn so that it provides a cable channel 106. A tension cable 108 is threaded through the channel 106 and when positioned over the metal support structure of hip beams 110a, 110b, 110c, etc. ridge beam 112 and cantilever beams 114a, 114b, 114c, etc. forms a sunshade canopy. A turn buckle tension means 116 is attached to the ends of cable 108 to provide adjustments and to maintain cable tension.

The canopy cover 104 is provided at each corner with a reinforced opening 98 as shown in Fig. 9, through which the oblong eyelet connector 84 on the cantilever beam extends.

From all of the above it can now be seen that the canopy is designed in such a way that the perimeter of the canopy is extended way over the perimeter of the play area. This is so in that the shading area of the play area will still be extended in the early mornings or later in the afternoon because at these times the sun rays are coming into the play area in quite a slanted direction and yet, the children will be protected from any direct sun rays.